

REMARKS

Claims 1-9 are all the claims pending in the application.

Referring to the indefiniteness rejection and §101 rejection of Claim 9 presented at Section No. 1, page 1, of the Action, Applicants have amended Claim 9 consistent with the description at, *e.g.*, page 1, lines 1-5, of the specification. No new matter has been added.

At Section Nos. 3 and 4 of the Action, the following prior art rejections are set forth:

Claims 1-3 and 5-8 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Japan Laid-open No. 63-136527 ("JP '527") in view of U.S. Patent No. 4,702,788 to Okui ("Okui");
and

Claims 2 and 4 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over JP '527 in view of Okui as applied to Claims 1-3, 5-8 above, and further in view of Japan Laid-open No. 9-272850 (JP '850).

Applicants respectfully traverse both rejections.

Referring to the subject matter of Claim 1, if the modification or combination of the prior art proposed by the Examiner would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. In re Ratti, 123 USPQ 349 (CCPA 1959). Likewise, if the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. In re Gordon, 221 USPQ 1125 (Fed. Cir. 1984). In other words, the Examiner's proposed combination of the prior art cannot destroy the teachings of the prior art reference being modified.

In the present case, the Examiner is proposing to modify JP '527 by substituting the perforated adhesive sheet disclosed therein with Okui's tape, which contains an unperforated adhesive backing. Such a modification, however, completely destroys JP '527's teachings.

JP '527 specifically discloses that the effect of its invention is achieved by the provision of a large number of fine holes. For the Examiner's convenience, a full English translation of JP '527 is being submitted herewith, and Applicants refer to page 2, lines 6-8 and 39-46, of the translation. As is described under the heading "Effect of the Invention" in JP '527, the semiconductor substrate is firmly fixed not only by the adhesion of the sheet but also by direct suction thereof from the suction base. As is apparent from the schematic drawing in JP '527, the adhesive sheet is positioned between the suction base and the semiconductor substrate. Therefore, for suction to be possible, both the base film and the adhesive must have perforations.

Thus, JP '527 specifically teaches away from a modification that would substitute the perforated adhesive sheet disclosed in JP '527 with Okui's tape, which contains an unperforated adhesive backing. Applying the teaching of Okui would completely destroy the teaching of JP '527 because the thus-prepared pressure-sensitive adhesive sheet would not function as desired and intended.

Furthermore, a person of ordinary skill in the art would never have referred to Okui in order to modify the pressure-sensitive adhesive sheet of JP '527 in the first place. JP '527 relates to the provision of a pressure-sensitive adhesive sheet for treating a semiconductor substrate. Back surface grinding of a semiconductor substrate is performed and a pressure-sensitive adhesive sheet is applied to the front surface side of the semiconductor substrate, *i.e.*, the side on which a device is fabricated, and the pressure-sensitive adhesive sheet is sucked to a suction base followed by grinding.

Okui is related to a completely different field. Okui is directed to packaging electronic parts. The purpose is to prevent small electronic parts, such as chip capacitors and ceramic capacitors, from dropping and simultaneously to ensure that these parts can be easily withdrawn from the carrier tape. Therefore, a person of ordinary skill in the art would not modify the pressure-sensitive adhesive sheet of JP '527 in the same way as an adhesive used for a different purpose.

AMENDMENT

U.S. Appln. No. 09/818,936

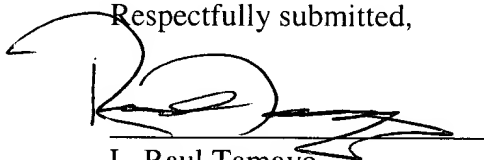
For each of the foregoing reasons, Applicants respectfully request the withdrawal of these prior art rejections of Claim 1.

Referring to Claims 2-9, their patentability is supported at least by their dependence from Claim 1.

Reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, she is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'L. Raul Tamayo', with a large, stylized initial 'L'.

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WASHINGTON OFFICE

23373

CUSTOMER NUMBER

Date: October 10, 2003

Appl. No. 09/818,936
Docket No. Q63636
Amdt. Dated October 10, 2003
Reply to Office action of
July 10, 2003



Japanese Laid-open Patent

Laid-open Number: Sho 63-136527
Laid-open Date: June 8, 1988
Application Number: Sho 61-283314
Filing Date: November 27, 1986
Applicant: NEC Corporation

Description

1. Title of the Invention

Pressure-sensitive adhesive sheet for treating semiconductor substrate

2. Scope of Claim

A pressure-sensitive adhesive sheet for treating a semiconductor substrate, characterized by having a large number of fine holes.

3. Detailed Description of the Invention

[Field of the Industrial Application]

The present invention relates to a pressure sensitive adhesive sheet for treating a semiconductor substrate used in grinding/dicing etc.

[Prior Art]

In a case where back surface grinding of a semiconductor substrate is performed, a pressure-sensitive adhesive sheet is applied to the front surface side of the semiconductor substrate, that is, the side on which a device is fabricated, and the pressure-sensitive adhesive sheet is sucked to a suction base, followed by grinding.

Conventionally, such a kind of pressure-sensitive adhesive sheet has pressure-sensitive property but has no hole.

[Problems to be solved by the Invention]

In a case where the above-mentioned conventional pressure-sensitive adhesive sheet was used, such a defect has been found that since a semiconductor substrate is fixed only by the stickiness of the sheet, peeling off of the semiconductor substrate is liable to occur when a relatively strong force is applied thereto. Also, if the stickiness is increased, conversely the semiconductor substrate is hardly peelable and apt to be cracked. Also, there arises a disadvantage in that a paste material is apt to remain on the surface of the semiconductor substrate. In particular, those articles for which recently a more reduction in thickness as compared with the conventional articles is required, such as IC cards and memory cards, have problems in that since the amount of grinding is increased, the force applied at the time of grinding is increased, with the result that the articles

are liable to be peeled off; and that since the semiconductor substrate has become thinner when the pressure-sensitive adhesive sheet is peeled off after the grinding, the articles are liable to be cracked due to the stickiness of the sheet.

[Means for solving the Problems]

The pressure-sensitive adhesive sheet for treating a semiconductor substrate according to the present invention has a large number of fine holes.

[Example]

Next, the present invention will be explained with reference to the drawings.

Fig. 1 is a top view of an example of the present invention; and Fig. 2 is a longitudinal cross-sectional view taken along the line A-A' in Fig. 1. The size of fine hole is about 0.5 mm to about 2.0 mm in diameter. Fig. 3 is a longitudinal cross-sectional view illustrating a state where the pressure-sensitive adhesive sheet of the present invention is used to make a semiconductor substrate be sucked on a suction base. The semiconductor substrate is fixed not only by the adhesion of the sheet but also by direct suction of it onto the suction base through the fine holes.

In a case where the back surface grinding is performed by the method illustrated in Fig. 3, the semiconductor substrate is sucked by a force stronger than that in the case where the conventional pressure-sensitive adhesive sheet is used, during the grinding, that is, while being sucked onto the suction base, so that the probability in which the semiconductor substrate is peeled off during the grinding becomes extremely small. Also, when the pressure-sensitive adhesive sheet is peeled after the grinding, the pressure-sensitive adhesive sheet of the present invention is easier to peel since it has a bonding area smaller than that of the conventional pressure-sensitive adhesive sheet and hence the adsorption power by the pressure-sensitive adhesive sheet alone is small. Accordingly, the probability of occurrence of cracking at the time of peeling the pressure-sensitive adhesive sheet becomes smaller.

[Effect of the Invention]

As described above, the present invention has effects of firmly fixing the semiconductor substrate not only by the adhesion of the sheet but also by direct suction thereof from the suction base at the time of grinding the semiconductor substrate or dicing it by through cut by the provision of the large number of fine holes, thereby being capable of preventing peeling off of the semiconductor substrate during the working.

Also, in a case where the pressure-sensitive adhesive sheet is to be peeled off, it is easier to peel so that the

occurrence of cracking can be prevented.

4. Brief Description of the Drawings

Fig. 1 is a top view showing a pressure-sensitive adhesive sheet for semiconductor substrates according to the present invention; Fig. 2 is a longitudinal cross-sectional view taken along the line A-A' in Fig. 1; and Fig. 3 is a longitudinal cross-sectional view illustrating the state where the pressure-sensitive adhesive sheet of the present invention is used to make the semiconductor substrates be sucked on a suction base.